GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

ILLUSTRATED SEMI-MONTHLY

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ONE OBJECTION to going to a convention so far away as Los Angeles is that, when it is all over, you have a sort of homesick feeling to take leave of so many nice people you may never meet again.

THE WEATHER at the Los Angeles convention was not served on ice, but brought on steaming hot. [When I visited California two years ago, the weather was very delightful — cool at night, and bright and warm during midday.—ED.]

FOR SOME TIME I've been learning that I'm not so large a man as I had supposed, but I never felt my littleness quite so much as I did after meeting the California bee-keepers with their big apiaries and big yields. They have big hearts too. [Yes, indeed they have.—ED.]

APIARIES are not very plentifully sprinkled along railroads. In the whole 2300 miles to Los Angeles I think not a dozen are to be seen. [Yes, and the major part of the dozen are to be seen mainly along the last two or three hundred miles as one gets closer and closer to Los Angeles.—ED.]

I DON'T KNOW much about such things; but I'm wondering if E. F. Phillips means to put it just as strongly as he does when he says that in the second case it is *never* necessary for a male and female to meet. Is there no cycle in the case that calls for the male to appear after so long a time if the race is to continue?

MR. EDITOR, I attach more importance to J. M. Mack's tool than you, for I can hardly agree that the accumulation of wax and propolis between top-bars does no particular harm. It means a good many bees killed if you don't go slow, and in time the accumulation becomes such that the spacing is greater. I can show you proof. [Perhaps you are right.—ED.]

NEVER BEFORE, I think, in the history of the world, did so many bee-keepers take so long a ride together in the same car as the 25 who rode in a tourist car from Chicago to Los Angeles. For five days and six nights their home was in that car, and you may guess they had a good time. It was a bee-keepers' convention in continuous session.

THE HOT SPELL during the national convention made some of the Californians afraid of a repetition of the experiences of 1883. That year it held at 115°, and M. H. Mendleson said that, in spite of his covering the hives with brush, the combs melted down in them, the honey ran out in a stream, the bees deserted the hives, and hung in huge bunches all about. When a bee struck the ground the sand was so hot that it turned over and doubled up, a dead bee.

YOU ARE RIGHT, very right, Mr. Editor, to advise against unqueening at beginning of settled warm weather in spring for the sake of having young queens reared to prevent swarming, p. 767. But the immense loss from stopping brood-rearing is not the only objection. I tried it one year with several colonies. The majority of them failed to raise queens so early, and those that succeeded seemed as much bent on swarming as if the queens had been reared the previous fall.

I'M WRITING this Straw in Los Angeles, Cal., on a table whose central adornment is a bottle more than a foot high, said bottle being placed there by A. I Root, who makes frequent potations therefrom, with many expressions of delight therewith. No, A. I. Root hasn't gone back on his temperance principles; the bottle contains nothing stronger than distilled water. I don't know that he got it at a bargain counter, but he seems greatly pleased that he got the whole gallon for 10 cents—bottle returnable.

THAT'S QUITE A SCHEME, p. 756, introducing two virgins at a time, and gains a lot of time. I tried it once, accidentally, in a full colony, and the bees swarmed out with the free virgin. Perhaps they never do that in the case of a nucleus. [I referred this Straw to our Mr. Phillips, and he says that he makes it a regular practice to introduce two virgins in strong colonies as well as in nuclei. Of course, there are times in the season when such a procedure, say during the height of the honey-flow, would force out a swarm.—ED.]

WHITE SAGE is perhaps generally thought by outsiders to be the principal one of the sages; but Californians say it cuts no great figure, the black and purple sages being away ahead, both in quality and quantity. [Yes, the average Easterner gets the impression that white sage is the main honey-plant of California, because all California honey from sage is named *white* sage. The black sage produces a great deal more, and the purple or button sage comes in as a close second. But white *sage* honey is not misnamed, because it *is* white, and it is *sage*, but not necessarily *white-sage*-plant honey.—ED]

"IT IS A QUESTION in my mind whether the accumulation of propolis or bits of wax along the edges of the top-bars does any particular harm," quoth ye editor, p. 707. I suspect that's because at Medina you sell off colonies so constantly that you have no combs of any great age, so there is no chance for accumulation of wax. When you get a good stock of burr-combs between top-bars, you must move slowly or you will kill bees; and later on you can not space up to place without cleaning off the wax. [Your point is well taken. It is true that, in sending out nuclei as we do, we are constantly renewing our combs, and perhaps none of them get so very dauby with propolis. But there is another point to be considered; and that is, the depositing of propolis in Marengo is much worse than in Medina. If I were in your place I would breed non-propolizers.—ED.]

FOR ONE DAY of my life, at least, I had a taste of the life of a California bee-keeper, when I spent the day at the home ranch—not the home, mind you, which was a good many miles away—of L. E. Mercer; and with such a host several of us had a most enjoyable day. Mr. Mercer, unlike others, does not rent, but owns the many acres occupied by his several apiaries, and the season's product from all of them was bunched in one pile in tin cans at the home apiary. It toted up 100,000 pounds from less than a thousand colonies, spring count, and it looked like a good bit of honey. Although every thing was on a big scale, the apiary with its surroundings was a model of neatness. [A few days among the bee-keepers of California is a wonderful revelation to an Eastern bee-keeper. But it should be borne in mind that these big yields come only once in three to five years. The intervening years are apt to be off, and the poor California honey-producer has to live on his earnings made during the good year, so after all he has no very great snap. Like the children of Israel of old in the desert, he has to make the fat years take care of the lean ones.—ED.]

I WONDER if L. B., p. 764, had a Miller staple-spaced frame before him when he said, "the stoppers are very nice to sharpen the knife on." They're nail-spaced rather than staple, but that doesn't figure. When you have a frame before you, there is little danger that you will deliberately take the pains to run your knife into the spacing-nails at the top, and there are none at the bottom. You see on each side the spacers are at only one end. [When I was in one of the large California apiaries helping to extract and uncap, I was thoroughly convinced that any form of metal spacer on extracting frames would be an intolerable nuisance. I do not see how a *nail* will be in any way better than a *staple*. I should prefer a staple, because of its rounding top as against a sharp nail-head or dowel-pin. Say, doctor, I hope that, before another issue is out, you will be put through half a day's experience in M. H. Mendleson's extracting-yard; and if you do not agree that metal-spaced frames for extracting are not to be tolerated for even one minute, then I will furnish you all the nail spacers you can use the rest of your days, free of charge—or any other kind of metal spacers, for that matter.—ED.]

A CORRESPONDENT writes with evident alarm, referring to the passage in GLEANINGS saying "the effect of the accumulated poison may be serious in its effects in after years, as it was in the case of Langstroth and some others." I don't believe it is worth while to raise unnecessary fear. My private opinion is that Langstroth's spells of mental depression had nothing whatever to do with bee stings. If they had, the effect of the accumulation of the past 42 years' stings ought to begin to appear in my case, and I never had more buoyant spirits in my life. [My, oh my! you have got a wrong impression. I did not say, or at least I did not intend to convey the idea, that bee-sting poison was responsible for those distressing periods of mental gloom in the last ten or twenty years of Langstroth's life. If you will remember, one or two of his last articles told how, after he got over these spells, he experienced a queer tingling sensation about the eyes and nose whenever he passed a hive at the beginning of spring. At such times the bees would elevate their stings, leaving a tiny drop of the poison to show very distinctly. The odor of it, Mr. Langstroth thought, poisoned him. There were several other reports that appeared at the time, and one or two in late years from persons who experienced the same sensations. But granting all this, I agree with you that no one needs to have unnecessary fears from the

effect of accumulated poison after being stung a good many times, or during the period of a whole lifetime. The cases of father Langstroth and the others are so few as to make them less than one in ten thousand—so rare, indeed, that they can scarcely be taken account of. Still, as I said in GLEANINGS, it is well for one to err on the safe side of having too few stings for fear he may be the one in ten thousand. And, besides, is there any thing to be gained, or any possible advantage, in having one's system inoculated with too much of the poison?—ED.]

A MODIFICATION of the shaken-swarm business that I tried this year seems to be an improvement. When it comes time for the first shaking, an excluder is placed over a weak colony or nucleus, say No. 5, and over this are put the shaken combs from four colonies, of course making the pile five stories high. If the lower story contains only a nucleus, enough bees are left on the shaken combs to secure the brood against chilling. If the lower story contains a fair colony, the bees are all *brushed* from the combs. Of course, empty combs were given to the shaken swarm. Ten days or so later four more colonies are shaken, and a pile is made over another nucleus or weak colony. This time, however, instead of empty combs the shaken colonies receive the combs of the four upper stories of No. 5, every bee being brushed clean from them. No. 5 is thus in fine condition to receive sections, because it has all the bees that have in ten days emerged from the combs in those four stories. The colonies last shaken will also be a good deal better off than if they had received empty combs, for they will have the bees that hatch from the combs during the next ten days. So far, however, as the queen is concerned, they are the same as empty combs; for as it takes her 21 days to make the entire round of laying, in that time filling the whole brood-nest, she has half of it already empty for her first ten days' laying, and at the end of that ten days the other half will be empty. In actual practice I could see no difference between giving these combs half full of sealed brood and giving empty combs, except, of course, the greater strength of the shaken colonies. [This seems to be a good plan, providing, of course, that colonies shaken on to empty combs will *stay* shaken—that is, not swarm out again. It certainly enables one to utilize the capital (brood) to the best advantage; but in our locality, in ten days the honey season would be over. We had a heavy flow of honey, but it stopped square off just as the bees were pretty well advanced in the supers. Cold rains came on, putting an effectual quietus on our plans. In this locality, and particularly this season, the plan above outlined would not work—that is, it would not enable us to use the brood in producing honey after it had hatched out.—ED.]

Moth-balls at the entrances of hives are recommended as a preventive of moths till moth-proof bees can be introduced.

M. S. Beverlin, of Colorado, says, "I have come to the conclusion that a man can not be up-to-date who does not take one or more good bee-papers."

Chief Chemist Wiley, of the U. S. Department of Agriculture, is reported as saying that he intends next year to plant onions with potatoes. He thinks the tears the onions will draw from the eyes of the potatoes will irrigate them enough to make them drouth-proof. Of course, that is "scientific pleasantry," or what Dr. Miller would label a "joke."

BRITISH BEE JOURNAL.

In speaking of bee culture as an industry in France, the following clipping is made from the Westminster *Gazette:*

Fruit culture and bee culture have both been recommended to the distressed British agriculturist; and perhaps the advice has sometimes been superogatory. It is permissible, however, to draw attention to the way in which the honey industry has advanced in France during the last few years. In ten years the output of honey has increased from 7,000,000 kilogrammes to 8,500,000 kilogrammes. The increase is due less to an increase in the number of hives than to the greater yield of each hive, which has now risen to about 500 grammes, or 11 lbs. a hive. What is more gratifying (to the French producer) is that, owing to the scientific methods of bee-farming, the yield each year has become more constant and less affected by vicissitudes.

That comes in well with what is said further about French apiculture.

The Sussex *Daily News* says:

A novel sight at the Hayward's Heath (Sussex) market, a short time ago, was a swarm of bees which came over like a cloud in the afternoon and settled on the wall at the Station Hotel, close to the base of the bracket of one of the large outstanding lamps in front of the building. A Mr. Ford essayed to take the swarm in a box, but they escaped from this receptacle and swarmed again on the wall finding an orifice which led to beneath the floor of the sitting-room in the hotel. In the evening Messrs Sands, Small, and Jolly, took up a board or two of the floor, and secured about half a bushel of the bees. Yesterday there was again a large number of them on he hotel wall, but not in the swarming mass which appeared on Tuesday.

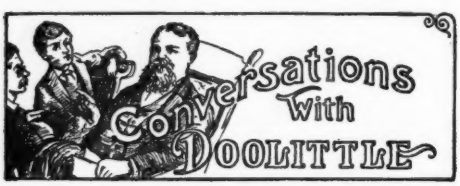
Concerning bees and their ways, the following is related in the *Globe:*

A curious place for swarming has been chosen by a hive of bees at Arcot Hall, near Newcastle, the seat of Mr. Howard Pease. The bees had swarmed up an apple-tree, and the gardener, on going up a ladder to examine, was startled by observing a green linnet fly out of the middle of the swarm. Closer investigation revealed its nest with two eggs in, the queen-bee hav-

ing settled on the nest with her attendant hosts, the linnet meanwhile calmly sitting on her eggs. With great care the gardener cut off the bough of the apple-tree — swarm, nest, and all; and, after having smoked the bees off, he carefully stuck the bough up again. The linnet returned to her nest, and is now sitting on four eggs.

AMERICAN BEE JOURNAL.

In the issue for Sept. 3, somebody asks Dr. Miller how much honey and wax are produced yearly in this country. He admits he does not know. The government statistics do not seem to be satisfactory. Probably the greater portion of the bee-keepers make no returns, not thinking it worth while to report the small and precarious crop which is used entirely on their own table. In this journal, page 111, 1902, the editor estimates the weight of comb honey produced annually in the United States to be 50 million pounds; extracted, 125 million; value, 8 to 10 million dollars. Perhaps these figures ought to be doubled. In France the government statistics are far more painstaking than here, and I am glad to find in *L'Apiculteur* a most elaborate report on the number of colonies of bees kept in France, together with the amount of honey produced in 1901. Each of the 87 departments of France is given in detail; but a summing-up for the whole country, up to Dec. 31, 1901, is as follows: Total colonies of bees, 1,675,929; honey of all kinds, 19,876,661 lbs. Value of honey, $2,723,612. Wax, 5,577,682 lbs., worth $1,100,000. The average value of wax would be about 19 cts. The population of this country is fully double that of France; but even if the French figures are doubled they will still fall far behind the estimate given for this country. But the latter may be faulty. I have a similar table for Austria; but as the unit of weight is not given I can not use it.—ED.]



LATE-REARED QUEENS.

"How do you do, Mr. Doolittle? As the nights are getting longer I thought I would come over a little while and chat a few minutes with you on bees."

"Yes, the evenings are quite a little longer than they were, and I am reminded that the bee season for 1903 will soon be over. How did your bees do this year, Mr. Brown?"

"I did not get much surplus, but find that the colonies, as a rule, have enough to winter on, for which I am thankful. It has been cold and wet nearly all summer, since the drouth ended in June. Then the hard winds, heavy rains, and severe hailstorms, have made the season unpropitious beyond any other season I have ever known."

"Yes, that is true. But what was the 'chat' to be about to-night?"

"I wanted to have a little talk about late-reared queens, as I wish to raise some during the last of this month. Bee-keeper Smith tells me that, if I so raise them, they will be of no use, as they will not find any drones thus late in the season, as the drones will all be killed off."

"If *all* drones are killed before any queen becomes old enough to be fertilized, and the season of the year is late fall, of course such a queen will become barren or a drone-layer."

"Why do you say barren? Smith said they would be only drone-layers, which would be even worse than no queen at all."

"I know some say drone-layers every time; but my own experience has been that nearly or quite half of the queens which I have wintered over that were not fertilized never lay at all."

"Without discussing that part of the matter further, was Smith right in saying that a queen not fertilized in the fall would be of no use whatever?"

"Well, that depends on the size of the colony she is in. If it is merely a nucleus, with no prospect of wintering over, then I should say such a queen would be worthless. But should the colony be a good one, or one strong in bees and rich in stores, then I should consider an unfertile queen of some value, as my experience goes to prove that a colony having a queen, be she laying or otherwise, will remain much more quiet during the winter months than will a queenless colony; hence the colony having a queen will come out stronger in the spring, with less consumption of stores, than will one with no queen."

"Will such an unfertile queen be of any use in the spring?"

"Only in one way. She can be allowed to remain with the colony until we are able to procure a young laying queen from the South, and thus a good colony may be saved which otherwise might be lost. But even in such a case I should consider it much more desirable to purchase a queen from the South, and introduce her to the colony having no fertile queen in the fall, where such is possible, than to try to winter over either a queenless colony or one having a virgin queen."

"Why?"

"My reason for so considering is this: Such purchased queen will commence to lay during February or March, and from her brood the colony will be materially strengthened before a queen could be procured in the spring, and thus the colony becomes ready to take advantage of the early honey-flows in the spring, which would be of little use to the colony which went through with a virgin queen, should she prove barren, and would be the means of having

some of the combs filled with drone brood, did the queen prove a drone-layer."

"Yes, I see that point; but a thought comes to my mind. How does any one know that all the drones are killed off in his section of the country previous to October 15th or November 1st?"

"That is a question I have felt like asking several times. One or two years I have been quite sure there was not a drone within reach of my queen's flight, and yet the spring proved that every one of my late-reared queens had found drones from somewhere, as they were all prolific layers of worker-eggs. In fact, every time I have tried to winter over virgin queens, by way of experiment, all proved to be fertile in the spring, except in spring following a fall during which the weather gave the bees no chance for late flights; and only as I have clipped the wings of the queens for these experiments, thus making it impossible for the virgin to fly out in search of any drone, have I been at all certain of success. From this experience I have ceased to worry over late queens failing to become fertile."

"Then you think there would be little risk in my trying to rear queens the latter part of September almost any year?"

"I so think. But no bee-keeper should try to rear queens late in the season unless several hundred drones are preserved from the very best stock he has in his apiary."

"But how are such drones to be kept? The bees are very persevering in killing drones in my locality after all of the honey-flows are over."

"It is quite an easy matter to keep choice drones, even as late as December 1, by taking frames of drone brood from choice colonies just before drone-rearing ceases, and putting said brood in a colony from which you now remove the queen. Ten days after the queen is removed, cut off all queen-cells, and such a colony will keep its drones as long as any are desirable in the fall."

"How is the strength of such a colony to be kept up as regards worker-bees?"

"If a frame of sealed worker brood is given to these colonies occasionally, its strength will be kept up, also the flight of drones will be more profuse late in the season than would be the case if the workers became few in number. Then if an upper story, filled with combs of honey, be placed on the colony which is to retain the drones, the drones will fly still stronger, for, to fly strongly, drones need plenty of honey within easy access."

"Thanks for this last suggestion. Have you any more that would be of help to me?"

"If you do not think it too much trouble, drones can be made still more active by feeding the queenless colony containing them plenty of warmed syrup or honey at about noon the latter part of September, half-past eleven during October, and at eleven o'clock during November, feeding only on such days as bees can fly. If, in addition to this, you go to this drone-keeping colony on some day during the latter part of September, when it is still, and yet so cool that you will not be troubled by robbers, and carefully go over every frame in the hive, killing every drone that is at all inferior as to size, activity, length of wings, shape, marking, or in any other way, you will have something along the line of drones for your late-reared queens to meet that will very materially enhance the value of every colony having a queen which may chance to mate with such a drone."

"About what would be the chances, do you think?"

"My experience says about 50 per cent in September; 75 in October, and 90 in November. During the latter part of October, and all of November, neither drones nor queens seem desirous of making long flights as in summer, and are not from the hive more than a few minutes on their flights, hence the mating takes place almost in your own apiary; and where you are sure that you have no drones save those hand-picked and preserved by yourself, you are almost absolutely certain of results. The course I have outlined is the one I have pursued for the past few years, and I think it has paid me fully as well as any work I ever did in the apiary. If we are to keep up with the times and the close competition of these days, we must strive for the *best* bees as well as the *best* honey, put up in the most marketable shape."

"Well, I must be going now, and I wish to thank you very much for this interview, Mr. Doolittle."

NOTICE TO MEMBERS OF THE NATIONAL BEE-KEEPERS' ASSOCIATION.

GENERAL MANAGER N. E. FRANCE, of the National Bee-keepers' Association, is preparing his annual report, and desires to include the replies from members in answer to certain questions that he sent out on a slip. He says if any have not received a set of these questions he will send another set if they will write him. Those who have received the questions, and who have for some reason or other neglected to send in their report, will confer a favor on Mr. France by filling out the blank and returning it to him as soon as possible. When the entire report is compiled it will make a very valuable document. But in order to make it complete he desires to hear from every member.

General Manager France has been hard at work on several cases; and when the time comes he will probably make them

public. Cases of adulteration are receiving his special attention.

THE FORMALDEHYDE TREATMENT FOR FOUL BROOD REPORTED A FAILURE IN THREE CASES.

WE have already had three reports where bee-keepers had tested the formaldehyde treatment, fumigating combs thoroughly in a closed box. The combs were put back into the hives, and the disease reappeared in each case. It is evident from *other* reports that the drug not only helps but cures. But the three failures already referred to should make every bee-keeper who is afflicted with the disease cautious — not to put too much confidence in it.

KEEPING HONEY LIQUID INDEFINITELY UNDER ALL CONDITIONS.

SOME time last fall Mr. H. R. Boardman told me he had discovered a plan by which he could keep his bottled or tumbler honey liquid almost indefinitely, and under almost any conditions. Although I had great confidence in whatever Mr. Boardman says, I doubted very much whether he could succeed to the extent he claimed. He may fail yet; but certain it is that I took one of two samples of honey that he sent me and placed it on the window-sill outside of my office. This was some time last fall. Throughout the entire winter this honey remained liquid; and to-day it is as clear and limpid as when I received it. I have never yet found any bottled honey that would stand zero weather through the winter, although it is quite possible to seal the honey while hot in glass or tin so it will remain liquid for one or two years, providing it is kept at an even temperature of from 50 to 80 degrees.

THE UNKNOWABLE BEE-PARALYSIS; IS IT CURABLE? IF SO, HOW?

A SHORT time ago I received some intimation—I do not remember when nor how—to the effect that our old friend O. O. Poppleton, of Florida, one whom I consider one of the most conservative and careful bee-keepers in the country, had a method for curing what we had formerly supposed was incurable—namely, bee-paralysis. I had intended to look into the matter, but had overlooked it for the time being. I now observe that my brother-editor, H. E. Hill, of the *American Bee-keeper*, is firing stray shots up my way that are evidently intended for me. Referring to the acknowledgment made by Geo. W. York, in the *American Bee Journal*, of the cure practiced by Mr. Poppleton, he says:

"There are some other editors and prolific apicultural writers who should arise and explain their ignorance of important information with which *Bee-keeper* students have long been familiar."

With the greatest of pleasure, my good friend. I desire to say, right at the outset, that when Mr. Poppleton says he has a method of cure for bee-paralysis, I am quite as well prepared to accept his statement as if I had seen the method applied, and its results. The plan in brief—a modification of it has been printed before in our columns, but I had not quite credited its efficacy—is sprinkling powdered sulphur over the affected bees and affected combs, but not till all the brood of the diseased colony has been removed, and put in a strong healthy one; for Mr. Poppleton says the sulphur kills all the unsealed brood and eggs. He finds that the source of the disease is probably not in the brood or combs, for he has put combs from paralytic colonies repeatedly into healthy ones, and never but once has the disease developed in another colony to which such combs have been given, and that was a year afterward. Mr. Poppleton rightly assumes that the infection—if it be such—came from some other source. He first used the powder-gun for applying the dust, but found he could sprinkle the bees better by picking up the powder between the thumb and fore finger. Every bee must be dusted. At first the disease will seem to get worse instead of better. The colony will dwindle down; but in two weeks there will be a decided improvement, and finally the colony will be cured and stay cured, while other colonies not treated with the sulphur will continue groveling in the throes of the disease until treatment is administered, when a cure will be effected within two weeks.

I hereby extend my apology to the *Bee-keeper* for not noticing so good an item; and when I neglect a good thing like this again I shall consider it a favor if our friend will send another shot or two up Medinaward.

I have before said that Mr. Hill is one of the best editorial writers in all our ranks. His journal contains many good things besides the two I have already given in this issue.

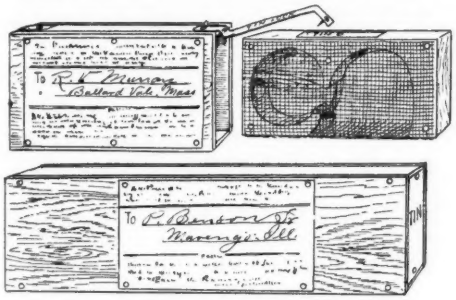
CAGES FOR MAILING QUEENS.

MR. FRANK BOOMHOWER, of Gallupville, N. Y., a prominent queen-breeder and bee-keeper in the eastern part of his State, uses a very ingenious introducing and mailing cage. Some little time ago a sample of it was mailed us, from which we have had engravings made that show fairly well its general construction and use. But first we will let Mr. Boomhower speak for himself. He says:

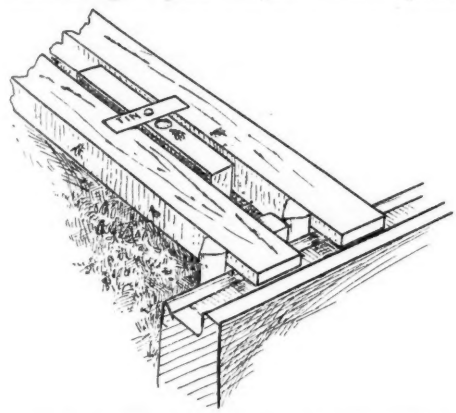
I send you withthis a case with three of my Novelty safety cages the way I make them now. You can see at a glance the superiority of these cages. They are the only shipping-cages that fully meet the requirements of the postal law regarding sending queens by mail. I have been told by a mail clerk at Washington that lots of live bees escape in the mails through unsafe cages that are unprotected. I myself last season, while in Bluemont, Va., received a shipment of queens from Georgia, and every one, bees and all, except one, was out in the mail-bag when it arrived at Washington. The cases were frail, with no protection only a thin pasteboard over the wire cloth. If the queens and live bees are again excluded from the mails we shall not be able to get them back again in a long time. I wish you would test the single cage I send you. Lay it on the floor and walk over it; let the heaviest man in your factory stand on it with his heavy boots or shoes on, and see how much it will

stand before breaking. You see they are made now out of waste scraps. I make these out of odds and ends from my waste pieces after sawing out hives, etc.

This cage requires 2 cents postage; but in the opinion of Mr. Boomhower and some others, the regular Benton, requiring only 1 ct. postage, is hardly large enough to send queens in through the mails, and hardly strong enough to stand the rough usage to



which such packages are subjected. The Boomhower cage consists of an outer case, open at both ends, and covered over with little strips of tin in such a way as to hold the cage securely, and yet allow sufficient ventilation for the bees within. If more than one queen is to be sent, the case is longer—say long enough to take two or three cages. In the one shown in the illustration, two cages are accommodated. The plan of introducing is quite simple. A little piece



of tin is nailed over the candy-hole, which, when turned at right angles, serves a double purpose. When it revolves the candy is exposed, and the cage is supported between the combs. See large illustration.

RAISING QUEENS A LA STANLEY; THE PLAN OF INTRODUCING TWO OR MORE VIRGINS AT A TIME.

ON page 446, May 15, we illustrated the Stanley method of securing cells on horizontal bars in brood-frames, and inclosing the same in cylindrical cages of perforated metal. In our last issue, page 756, we referred to having tested the Stanley cages.

We now take pleasure in illustrating a modification, such as we have been using in our yard with a great deal of pleasure and success. On page 806 of this issue will be found a brood-frame with 14 virgin queens hatched from as many cells, each inclosed in a cylindrical perforated metal cage. Our Mr. Phillips said he had something nice he wanted to show me, and told me to bring my camera, and this is what I found. In the bottom of these little cages are inserted plugs of wood in which are smaller plugs of candy.

It does not matter just when these cells hatch out their virgins. The queens to be may come forth at different times; but they are all protected in a warm brood-nest, and are probably fed by the bees through the perforated metal.

Whenever virgins are needed, all we have to do is to go to one of these nursery-frames in a colony, take out one or more cylinders of queens, and insert them into nuclei, but always in pairs, as we explained on page 756. I asked Mr. Phillips why he did not use tinned wire cloth. "Because," said he, "the perforated metal holds its shape better."

We do not use the *queen-excluding* metal, because in some cases the cells are attacked, and in other cases the bees can get in and worry if they do not absolutely ball the virgin. Our method differs from the Stanley in that we use small perforations and cylindrical wooden plugs in place of gun-wads. Instead of being stuck to the cell-bar with melted wax, we use a nail-point that just projects through the plug of wood. It is thus easy to attach these plugs to the bars, and just as easy to remove them. Gun-wads are very good, but they are not thick enough to handle readily.

Referring again to the illustration, it may be interesting to note that every one of the 14 cells, inclosed in as many cages, hatched a virgin, bright, healthy, and vigorous.

Since writing the forgoing I have received a letter from Swarthmore, or, more exactly, E. L. Pratt, of Swarthmore, Pa., who calls my attention to the fact that he has been using this dual or multiple plan of virgin-queen introduction for three years, and has been furnishing hollow plugs in connection with the Swarthmore nursery cage, for the purpose of allowing colonies to release queens on the candy plan, for two years. He refers me to an article written by him in the *American Bee-keeper* for March, 1903, page 77, giving in full his plan for introducing two or more virgins in a hive at a time. This article I had overlooked. He even anticipated us in seeing the very great advantage of such a plan of introduction, for he says in the article referred to:

> By the above-outlined proceeding it will be seen that supplies of virgins, about the correct age to fly, will be constantly on hand, already introduced, waiting their turn at the boxes; and if the system is followed closely from five to six fertile queens will be ready for caging every ten days.

In connection with this plan he uses his small miniature nuclei, which have been condemned by some of our subscribers, and which have, in fact, proved to be a failure in the hands of Mr. Doolittle and ourselves. Swarthmore then pertinently remarks, in his letter referring to the matter:

Now, Mr. Editor, since your Mr. Phillips is successful in at least two Swarthmore practices, is it not possible that he might be just as successful with the fertilizing boxes? I shall run these boxes after frost, and call to witness some of the men in whom you place more confidence than you seem to place in me. I can show that temperature has not much to do with the success of these one and two comb boxes when the principle of their handling is understood. Perhaps your Mr. Phillips may be able to improve them, and thus carry on a work that you yourself admit is important.

In another letter I am asked to make him a visit, and see these small nuclei working successfully day after day, turning out laying queens by the wholesale. But the extensive arrangements we are making to take care of our business another season will make it impossible to get away now; but I hope to see next season what Swarthmore is doing. He has certainly originated some very unique as well as short cuts in queen-rearing; and while at first they seemed to be of doubtful value, our Mr. G. W. Phillips has been and is now making several of them pan out well. It is reasonable to suppose that, if Swarthmore can make these small nuclei work, *we* can do it; and I therefore propose to give the matter a trial next season.

Mr. Phillips told me that I had made it none too strong in saying that two virgins, or a dozen, can be introduced at a time, if necessary, and that as soon as one virgin is removed another one may be released in three or four hours, practically wasting no time in introducing. By the old plan of giving one queen to a nucleus at a time he can not get more than one laying queen on an average in less than 12 days; but by his new one he is able to get two laying queens from a nucleus in a week on an average. This means that the queen-breeder can more than double the output from an average nucleus; and even he who rears queens for his own use can have fewer nuclei, and queens laying and ready for business in much less time. To the queen-breeder and the honey-producer alike the dual-virgin plan is invaluable.

A MODEL BEE-CELLAR IN MICHIGAN.

MR. JAMES HILBERT, so well known to our readers as an enterprising and progressive bee-keeper, and a neighbor of A. I. Root up in Northern Michigan, has one of the best-constructed bee-cellars in the country; and on my last trip I secured two photos showing it inside and out. The cellar proper is half above ground and half below. The upper story is a general workshop and honey-storage room. The structure is situated on a side-hill, and is built in such a way as to make it not only frost-proof but so as to give it a uniform temperature. I wrote to the owner, asking for some data regarding its general construction, and he writes as follows:

The cellar is 14 x 24 inside. It is built 3 feet under ground and 4 feet above. The foundation is a stone wall 3 feet deep with six-inch studding on the wall, boarded both sides, and filled in with sawdust. There are also inch cleats nailed on inside, and lathed and plastered, making a one inch dear-air space.

In building the stone wall we laid in 2 x 6 plank, letting them project 2 inches, and lathed and plastered on these, making a dead air space on the stone wall, to do away with the dampness.

In one corner there is a tile drain, or intake, for fresh air, leading out 6 rods under ground, 3 feet deep. The cellar is built on higher ground, which makes it very convenient for underground ventilation. There is also a ventilator leading out through the roof, 12 inches square. This comes within 3 feet of the cellar bottom, and is arranged to shut off too much draft. The outside has been reinforced with a foot of sawdust coming above the cellar a foot, with tarred felt covering the whole. The floor above is made frost-proof by nailing on ceiling, filling in with sawdust between the ceiling and floor, and nailing inch strips to the ceiling, and then lathing and plastering. This cellar has never been cold enough to freeze, the temperature ranging from 41 to 45. I can put in 200 eight-frame hives if necessary. I have wintered 150 in this cellar very nicely. It stays very dry and nice all winter. The upper part is used as a workroom and for extracting. The cost was about $150.

Bingham, Mich. JAMES HILBERT.

It seems that our friend found that the stone walls projecting above ground were hardly sufficient to keep out cold in severe weather: he therefore protected it with extra sheeting packed with sawdust. This is shown in the half-tone, reaching half way up on the building, or just covering the lower room or cellar proper.

An interesting fact in connection with this cellar is worthy of recording here. Mr. Hilbert puts his bees in the cellar along when cold weather comes on; but instead of shutting the bees up in the dark, as is the practice with most bee-keepers, he leaves the door open until along in *very* cold weather. Then he closes the cellar, and leaves it closed until near spring, or when the bees are to be taken out. The advantage of such a procedure is this: The bees are given a large amount of ventilation during the fore part of winter, and at the same time they are protected. When the weather gets too cold the door is closed, when the temperature is maintained at 40 or 45° throughout the winter. One would naturally expect that the bees would fly out with the doors open; but Mr. Hilbert says that, as he manages, they do not.

This repository embodies some of the principles of the Bingham, such as a ventilating-shaft from the roof. The upper story, as explained by Mr. Hilbert, has a double-thickness floor packed with sawdust. In these two respects the Bingham and Hilbert are very much alike; but the latter is much more expensive, and, perhaps I might say, a more *useful* building. The cellar is more get-at-able; the bees can be more readily carried down through the covered doorway, going down only two steps. There are two doors — one on the extreme outside and one in the cellar proper.

For a perfect wintering-cellar I have not seen any better; and if one desires something really first-class I would advise him to build on the line shown by Mr. Hilbert.

VENEZUELA AS A BEE COUNTRY.

The Bees and the Flora; some Interesting Facts Regarding the Industry.

BY W. K. MORRISON.

Venezuela has of late years taken a very prominent place in international affairs, yet I have never seen any thing in print relative to its bee-keeping possibilities, probably because most people look toward it as a source likely to create a fight, and a fight or diplomatic duel is of far more interest to the general public than any thing that can be written regarding the peaceable exploitation of Venezuelan resources.

That Venezuela has a bee-keeping industry may be news to some; but it has one in embryo, with plenty of room for "expansion" without resorting to "jingo" methods

Probably it would be quite useless for me to say any thing about the chances for a modern bee-keeper without saying a word about the government and the people. Strictly speaking, Venezuela is governed on anarchial principles, hence every man practically defends his own life and property, and the same is true of Colombia, Ecuador, Peru, and Bolivia. If the reader grasps this fact it may aid him to understand clearly many things that appear in the public press about these countries. Rightly speaking, there is no government in Venezuela. The people are much like the Mexicans—a short, squat, copper-colored race, with about 3 per cent whites and perhaps 10 per cent Africans, who chiefly frequent the coast cities, and who are, as usual, hewers of wood and drawers of water.

Only one word suits Venezuela—"magnificent." I never saw any thing so awe-inspiring as the mountains that form its coast-line. Approaching in the early morning in a steamer, I saw a great black wall that reached from the clouds to the sea. It seemed as if day and the blackest night had met. About three hours later the sun got around the wall, and we began to see the wall was not quite perpendicular, and there were houses at the foot of it along the beach. Later we could see the whole mountain was clothed in verdure to its summit, 8000 feet above our heads. But 8000 feet makes a rather high wall, and it is this high wall which makes Venezuelans think their country free from invasion.

It is in the interior valleys, behind this wall, where bee-keeping will probably pay best. It is there also where *Apis mellifica* can be found in a wild state, and nowhere else so far as I could discover. It is there, too, where the bulk of the Venezuelan population is to be found, simply because it is the healthiest section of the country. Further south I do not think *Apis mellifica* can exist unprotected by man. Its enemies are too strong for it; but it is just there where the stingless bees do best, and where there are the greater numbers of species. If the inquirer were ignorant of this matter he would be led to believe by what the natives say, that stinging bees exist all over the country. There is a species common on the low country, which bites with relentless fury; and hearing what the natives have to say, the stranger would naturally understand that the ordinary honey-bee was meant. It is a very different insect, however. It builds its cone-shaped nest over or in a hole in the prairie, and at the distance of a few feet looks to be identical with *Apis mellifica*. It carries pollen in the same manner as its relative, but is a little shorter, and its wings are longer. The number of bees flying out and in a nest is about the same as of the hive-bee. All together it is a very interesting bee to a bee-keeper.

Around Caracas there are now a few bee-keepers using modern implements, though when I first visited the locality there were none; in fact, I constructed the first few hives with my own hands, having very few tools to work with. There are bee-hunters all about the country who peddle in a small way the native bee-nectar of the country.

Caracas is a mighty interesting place; at least it was so to me. The civilization is very peculiar, so are the houses and all else that go to make up a large city. The situation is grand and unique, at the head of a fine valley which slopes away toward the Orinoco. The sea is actually only 3½ miles away through the mountain wall, yet the sewerage of the city is carried hundreds of miles before it reaches the ocean. The climate is fine, and somewhat like that of Bermuda. It is even chilly in the evenings, being 3000 feet above sea-level.

There are plenty of honey-plants about. Around the mountains may be seen lots of the *Ipomea* family, including the aguinaldo. Mahogany, a kind of rosewood, and coffee produce large quantities of honey. Coffee would be a grand honey-plant if it were not for its short season, only 48 hours; but around Caracas it is grown at all elevations, so that its period is lengthened out. The coffee of Caracas is world-famous for its quality. It is known in the United States as Mocha coffee. The cacao, or chocolate, of Caracas, is equally good, in my opinion unrivaled. There are three places where one can get a good cup of coffee—Caracas, New York, and New Orleans; but only one for chocolate. Real vanila is used for flavoring it.

Venezuela is not a place for fruit. Indeed, very few of the South American coun-

tries are. But fruits can be seen on sale there that I imagine are not known elsewhere, mostly belonging to the passion-flower, anona, and persimmon families. The local market for honey ought to be good, as the price of all food is high; but the producer could scarcely expect to ship, as the railway charges would be high. The railway crosses from La Guayra those same mountains already mentioned, at an elevation of 5000 feet; hence, though only 3 miles away by tunnel, the railway requires 22 for its zigzag course. It is a great engineering feat, but very expensive to maintain, hence the high charges. A locomotive hauls only two cars, and small ones at that.

Caracas, to a person who understands the language, and who is interested in men and things, would be a fine place to live in, despite its semi-barbaric civilization, and it is wonderful to me how modern improvements can be grafted on to such a people. I mean such things as telephones, street-cars, electric lights, and the like; and to sit at night in Bolivar Plaza, with a band playing, waiters flitting about with refreshments for the listeners, the whole lit up with an excellent supply of gas, one can hardly realize that he is not in a highly civilized country.

Probably a bee-keeper combining poultry-raising and dairying with his apiculture would succeed very well. Still it would be a risky enterprise in so wild a nation. At Porto Cabello there are much better chances, for if the Venezuelan can't or won't eat the honey it can be exported. It is a fine port, as its name indicates—"the port of the hair," for even a hair is not required to moor a vessel alongside the wharves. There is a gap in the mountains here, and this gives the cattlemen of the Orinoco the opportunity to get their wild-looking cattle right up to the steamer's side. For the same reason it might suit a bee-keeper, as he could ship to any port in Europe. He could safely reckon on a crop every year; and if he were to combine his business with cacao-growing, possibly he could do fairly well.

The conditions are pretty much the same as in Cuba; in fact, there is no appreciable difference. There is nowhere else in Venezuela worthy of mention.

SHALLOW HIVES WITH CLOSED-END BROOD-FRAMES.

The Bingham Hive.

BY J. O. SHEARMAN.

The spirit moves me—or, rather, W. K. Morrison does—to say something on the subject of shallow hives again, as I have been using such for over thirty years, and have seen no reason to discard my original size of frame (the Bingham, 20 inches long by 6½ deep, and 1⅜ from center to center). If I had to start all over again, however, I should prefer frames 1¼-inch spaced, and with closed ends entirely, for the following reasons: 1. Less propolis used in the hive; 2. Less waste room; 3. Less trouble with brace-combs; 4. Less room for millers to hide in.

A year or two ago, Mr. Editor, you wrote me for an article describing closed-end frames. I made it as short as I could, because editors object to long articles; but if I had written up their advantages as well, I would have given some of the pointers in Mr. Morrison's article. In fact, he agrees with my experience very nearly, only I use a brood-chamber 20 inches long, and anywhere from 2 to 12 frames wide, as it is adjustable without dummies, which are a nuisance. The two or three frame is for a nucleus, though I make up most of my nuclei with little frames, three of which occupy the space of one ordinary brood-frame. Seven of these little frames fill a nucleus-box; or by taking out the middle one, and inserting a division-board, two three-frame nuclei may be kept in one box.

Closed-end frames are the only ones that will each occupy *exactly* the same space, unless we except the Hoffman, which is virtually the same principle not carried out to a common-sense point—that is, the Hoffman frame makes waste room.

Last year I tried an eight-frame L. hive by trimming the combs and tacking on thin strips of wood all the way down the end pieces, so as to space them 1¼ inches apart, then put 9 frames in a hive instead of 8, and they did as well, and had one more comb to brood in, but less room to make up extra drone and queen cells, as any bees will do in any hive.

Any hive with a hanging frame is a bother for me, except in an upper tier for extracting; then I move them apart so as to use one less comb in the same super. These drone combs do no harm above queen-excluders. That is the only place I want drone comb if I can help myself, and none in the sections until after the swarming impulse has passed, else the queen is apt to go up into the sections, as all queens seek to lay drone eggs before swarming.

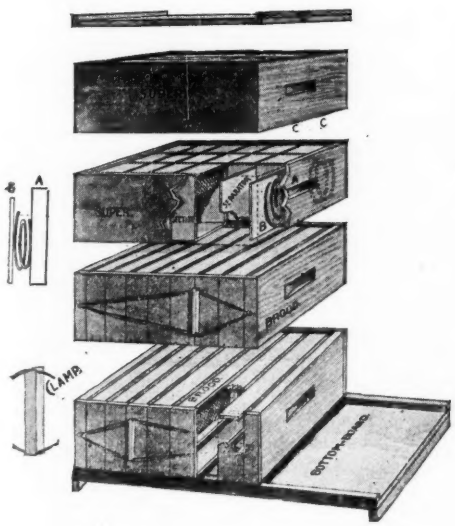
My brood-chamber is adjustable by simply moving the back board *back* in order to put in more combs. The most of my comb-honey colonies have eleven or twelve combs from June to August, but may have ten in September, or possibly only eight or nine for winter. For extracting I space the brood-chamber to the width of any super I wish to put on; or if for piling Bingham frames, then put eleven below, and have a case that will hold eleven or twelve with a movable back inside, in order to wedge up and tier up—the more the better if bees are in condition and a good flow is on. The ten-frame Bingham hive has nearly the same capacity for brood as the eight-frame L. hive. The ten-frame L. hive is too bulky for me to handle. I once, over twenty-five years ago, tried an experiment for comb honey, or trial between ten L. hives

(the ten-frame) and ten Bingham hives. I put a prime swarm in each alternately, giving a full set of combs, and boxes on top. I kept account of it, and the Bingham averaged over $1.00 worth more of honey. I tried a few of the L. hives the next year, but they did not pay as well, so I put them to extracting. That ended big hives for comb honey with me.

New Richmond, Mich.

[That our readers may know a little more exactly what the Bingham hive is like, we reproduce a cut we made for it about one year ago, and which appears in our A B C of Bee Culture, under the head of "Hives." Mr. Bingham is a pioneer in the use of shallow hives and closed-end brood-frames. Indeed, I believe he holds the earliest patents ever issued on such a combination—patents that have long since expired by limitation. There are many features about the Bingham hive that will commend it to the practical bee-keeper, especially the one who finds the Langstroth frame a little too deep.

I have had a feeling for years (perhaps I am mistaken) that the closed-end frame would be the only frame used by bee-keepers in the future. Propolizing and bee-killing, formerly supposed to be insurmountable barriers in the experience of



those who have used these frames for years—yes, and I might say for a lifetime—are not a tenth as bad as the advocates of the open end frame have held. There are probably ten times as many closed-end frames in use now as there were ten years ago; and this statement is based on our experience as supply-manufacturers during the time stated. But perhaps not all people may like shallow hives.—ED.]

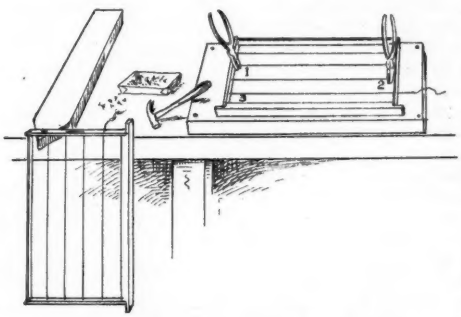
TIGHTENING THE WIRES.

Shall we Draw the Wires Taut? and if so, How?

BY G. C. GREINER.

To supply the "missing link," as the editor rightly calls it, I herewith give a description of what I consider the proper way of tightening the wires, with drawing to explain more fully the operation.

As an introduction, I will say right here that I have never, until this summer, had any practical experience with wired frames, and that I have used full sheets for brood-combs to a very limited extent only. Last summer I used about 15 lbs. of full



sheets on wired frames, with the main object to investigate and gather such information as thorough work and close observation could furnish. After reading on this subject all that I could find, and before I had undertaken to do the work itself, I had given the matter a thorough theoretical going-over, and had come to the conclusion that, the tighter the wires, the better it would hold the foundation. I could see no reason why a looser wire should keep foundation from bulging or buckling any better than a tighter one; consequently I tightened all my wires all they could stand. I made them sing like "fiddle-strings," perhaps not as high as the A or E pitch, but something like the D or G strings, until the end bars were slightly sprung in. All my frames have four wires, not because I considered them really necessary, for I think three or possibly two, as Mr. Coggshall uses, will do; but I meant to do a thorough job, and follow GLEANINGS' advice, which I think is "to put a wire every two inches."

A few days ago I got the proof of the pudding. I examined every comb of every young swarm that I hived on full sheets (I used about all of the 15 lbs. for that purpose), and found practically every one as even and true as a board dressed on both sides.

When I string the wire in the frame I take no pains to draw it tight—simply thread it as you would a sewing-machine. After the frame is taken from the wiring-board it is naturally still looser, so that, when all the slack is taken out, a couple of inches may have to be cut off.

To tighten the wire, we need a little tightening-outfit. First a nailing-block to drive the 2 oz. tacks in the frame. This is a dressed piece of 2×4 scantling, hard wood preferred, about as long as the bench is wide, laid across the bench, with a pointed end an inch or two projecting—see drawing; then a tightening-board. A piece of board like the wiring-board, or a little larger than the frame, fastened to the bench, will answer. Four pins or headless nails are driven into this to fit the four inside corners of the frame, all slanting a trifle toward the center. A small hammer, a pair of common wire-pincers, a pair of shears, unless the pincers have a wire-cutter, and some 2 oz. tacks, complete the set.

Now the operation. Hold the frame on the block as shown in the drawing; drive a tack about ½ inch from the hole of the wire end, within $\frac{1}{16}$ of the head. Give the end of wire one wrap around the tack as tight as you can draw it with your finger, and drive the tack home (head clear in). Move the frame from you and let the other end of end-bar rest on the block and drive another tack the same as the first, ½ inch from the hole of the other end of the wire. Lay the frame on the tightening-board, tacks to the right, and step to the left. With your left hand take the slack out of the first wire by drawing the second wire to the right. Grab the second wire, with pincers in right hand, close to the end bar (Fig. 1); using the upper edge as a focus, draw the wire as tight as it will bear. Lay your left thumb, fingers inside, on the wire to keep it from slipping back, and release the pincers. Reach over, and with the pincers take the slack out of the second wire by pulling on the third; slip the pincers close to the end-bar (Fig. 2), and use the upper edge again as a focus, drawing the wire as tight as before. Release the left hand; reach over, and, with fore finger and thumb inside, keep the wire from slipping back. Reach back with the right hand, and repeat the same operation at Fig. 3; and while the left hand holds the wire at this point, let the pincers take the wire at Fig. 4, about one inch from the end-bar. After the slack is taken out and wire drawn tight, make a tight wrap around the tack; this holds it until the latter is driven in. To give the pincers a chance to make this last wrap, the frame must be lifted an inch or so from the board.

Just how tight the wire can be drawn, and how to manipulate the pincers when winding the wire around the tack, can not be explained on paper nor even in verbal conversation. It requires some practical experience. We have to break a few wires before we get the idea.

On paper this operation seems like a lengthy job; but it does not take nearly as long as it does to write it or read it. With a little practice, and if done in a systematic way, a person can go over a stack of frames in a hurry.

La Salle, N. Y.

[Whether or not you should draw your wires taut will depend on the weight or heft of foundation used. Wax 8 or 9 sheets to the pound will buckle in the drawing out if the wires be drawn taut. Sheets 6 or 7 feet to the pound will draw out into good combs as flat as a board, whether the wires be drawn taut or not. But a tight wire will not begin to stand the strain of one drawn moderately loose. The reason of this is obvious. If it is stretched to half its breaking strain, a little more strain will break it, like a slam or bang in an extractor. If there is no strain on the wire, and it is drawn tight enough to take out all the slack, and a little more, it is easy to see that it will stand a good deal more strain than if it be drawn up more nearly to the breaking-point.

But there is another factor to be considered. The tighter the wires are drawn, the heavier the foundation required. I believe it is possible for one to use a very light grade of wax by using wires drawn to the proper tension—not too taut. Foundation 8 or 9 feet to the pound is certainly cheaper than 6 to 7 feet; and if looser-drawn wires will stand a greater strain, and if you get as good comb with lighter foundation, you are saving in your pocketbook and getting good and stronger comb.

Some six or seven years ago I conducted a series of experiments in this matter of wiring and the degree of tension that could be placed on the same. At first I drew my wires tight, and put in heavy foundation, or what we then called "medium brood." All went well. Later on I used the same tension of wiring, and used light brood. Then the trouble began. The foundation buckled or bulged in between the wires slightly—not seriously, but enough to show that I was getting somewhat of a corrugated-roof effect. Some one, I am not sure who, said if I reduced the tension of the wires so that they could sag a little bit with the foundation, the combs would come out true and nice, and they did. That person, if I remember rightly, was Geo. E. Hilton, of Fremont, Mich. If so, he can corroborate by his own experience the matter covering some years before that time. We had been using perpendicular wiring, and Mr. Hilton took occasion to compliment me for recommending horizontal wiring in opposition to the views of my respected father.

All foundation, in proportion to its weight, has a tendency to stretch a little in drawing. The stretch is downward a very slight amount. If the middle supports or the wires will allow no sag, there is pretty sure to be a wavy appearance to drawn comb.

It would be very interesting to know how heavy your foundation was where the wires were drawn up like fiddle-strings. I will bet a cooky that it was medium brood; and if so, I can readily understand how you got nicely built-out combs. Try the experiment again with light brood, on a warm day, or in a strong colony, and see what you will get.—ED.]

AN EIGHT-FOOT SWARM FROM A 16-FRAME HIVE. SEE NEXT PAGE.

THAT BIG SWARM OF BEES.

I send you my photo of bees taken June 8. The main cluster measured a little over 6 feet, and a small cluster besides. It came out of a two-story sixteen-frame hive. There might have been two swarms that went together. I was not present till they had clustered. My folks said they thought they came from only one hive.

The photographer was afraid of getting stung. He took two proofs. I will send you one of each. I look more like a negro than a white man. I am quite light-complexioned, and have light hair.

Bees have been doing well up to present writing. The white clover has been the best for years. Sweet clover is in full bloom now, and bees are busy yet. We have no fall pasture here — no buckwheat nor goldenrod. The frost or something else killed the bloom on basswood in my neighborhood last spring. L. J. BERGH.

Mount Horeb, Wis., Aug. 4.

[The variety and shapes of the clusters of bees that one will run across is surprising. Sometimes a swarm will hang like an inverted cone; at other times it is like a long cylinder, in which case it will resemble the swarm shown in the illustration shown on the previous page. The probabilities are that the two clusters that are shown form one swarm, for it is not uncommon for bees to divide up into two clusters, both near at hand.—ED.]

FORMALDEHYDE OF AMERICAN MANUFACTURE.

The accompanying note is of general interest. I can only repeat that the statements I made were copied from circulars of Schering & Glatz, and given on their authority. It is gratifying to know that we can have something as good (and perhaps at less cost) of American manufacture. Why not have something fitted to the case of the every-day bee-keeper quoted among bee-supplies? C. C. MILLER.

[The letter referred to is as follows:]

Dear Doctor:—In your reference to my note in GLEANINGS, July 15, you say formalin is a 40-per-cent preparation (of *what?*). My statement, to which you refer, that it is an aqueous solution of formic aldehyde, is correct, and I don't see that you amend it at all. You say it is made by the Schering Chemical Works; but, in fact, it is made by the Chemische Fabrik auf Actien, formerly E. Schering, Berlin, Germany. You say the word "formalin" is patented. Is it? I know the *method of vaporizing formalin pastils, etc.*, is patented. This necessitates the purchase of their rather expensive apparatus. For this reason, and knowing from several years' use of the pastiles that they will deteriorate, I would not advise their use to bee-keepers.

The device of Mr. J. M. Thomson, p. 391, has all the requisites of a formaldehyde-generator, and can be made very cheaply. You seem to attach much importance to the word "formalin," while I regard the substance, formaldehyde solution, of greatest moment; and this, made by American manufacturing chemists, can be relied upon, fully as well as that of foreign makers.

H. O. VASSMER.

Excelsior Springs, Mo., July 23.

A BAD MESS; WHY BEES DO NOT WORK IN SECTIONS.

I recently purchased four two-story eight-frame hives of bees. The party from whom I purchased assured me that sections had been placed properly in the top story. A few days after I got them home I discovered that he had prevaricated, as there was nary a section in any of the supers. I found that comb had been built from the cover, and extended down, and was fastened to the top of the brood-chambers, in the lower story. I undertook to remove the honey and clean out the super. In doing so I found a great quantity of brood in with the honey in the super. When would be the best time to take this honey out, and in what way would it be best to proceed? If brood is found in all of them, what can be done with it? Why will bees not work in the sections of a super newly put on, when the bottom part is full? What can I do to induce them?

C. P. SAVAGE.

Dunmore, Pa., Aug. 17.

[The only thing you can do is to smoke the bees down so that you can get at the combs with a long thin-bladed knife. Cut out all the brood-combs, and use the rest for chunk honey to be used on the table or to be sold among your neighbors. The brood may be fitted into brood-frames and allowed to hatch out.

As to why bees seem disinclined to work in sections is a question not easy to answer for all conditions. It is evident that they do not like individual compartments where individual combs separated from the rest of the brood-nest are to be built. They much prefer to work on large surfaces going through the brood-nest without obstruction. This is more especially true of pure Italians. But no matter what their preference, man prefers his comb built in little boxes so he can conveniently handle them for purposes of retailing. The time may come when consumers will be willing to accept chunk honey; but the laws will have to be much more rigid than now or else adulterators will take combs and mix them with pure glucose, and palm them off for pure honey. Bees

may be induced to go into sections by putting in bait combs; but a better way is to have the colonies so overpoweringly strong that they will be compelled to go above, simply to get room; but in that case the entrance will have to be large, otherwise the bees will cluster out and loaf.—ED.]

IS IT PICKLED OR FOUL BROOD?

I have in my apiary a number of colonies which are affected with what seems to be pickled brood. We have shaken out quite a number of colonies, using formaldehyde on the empty combs. What is singular about the matter is the fact that the diseased brood is, of its own accord, disappearing from many of the worst-affected colonies without any treatment whatever. In many colonies there are only a very few cells of diseased brood, while the combs are filled with healthy brood. Do you think that, under these circumstances, it would be safe to let such colonies go over until spring for treatment? Would it be safe and effective to treat the diseased combs with formaldehyde in October, after the healthy brood has all hatched? Will formaldehyde disinfect combs of sealed honey so that they can be used for winter stores?

W. H. LITTLEJOHN.

Battie Creek, Mich., Aug. 11.

[The probabilities are that you have a form of pickled brood. While foul brood will disappear under some conditions, during a strong honey-flow for example, as a general rule it will continue to grow worse. Pickled brood will come and go; in fact, that is one of its peculiarities. My advice would be to treat all the combs in the fall with formaldehyde as you suggest. If you have any doubts at all it would be advisable to subject *all* the empty combs that you may have to this treatment. It will do no harm, and might save the spread of a dangerous disease.—ED.]

DAMPNESS IN THE CELLAR.

I should like to winter my bees in a cellar. The cellar is 16×18×7, and has 3 windows 28×12 inches. There is never any water standing in it, but is a little damp at the bottom (which is of brick). We use a heating-stove in winter above the cellar. Please give me advice if it be a good idea to put a pipe into the cellar connected to the flue so as to draw the dampness out.

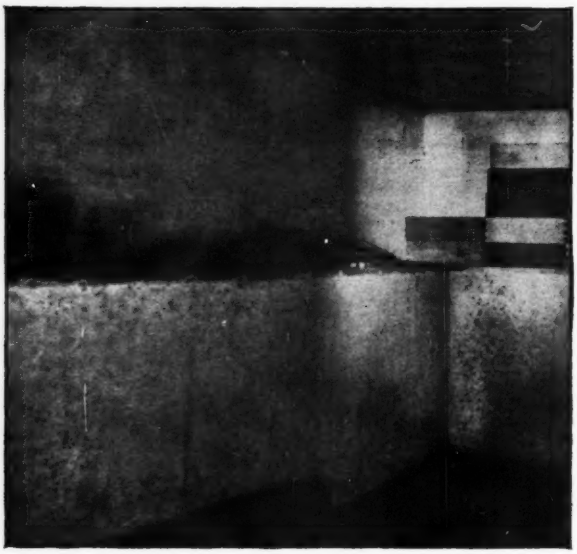
Brookville, Ind. H. W. SUHRE.

[Dampness in the cellar does no particular harm, although perhaps it may be advisable to remove it by the plan you suggest. A flue that connects with the regular chimney of the heating-stove is a very useful appliance in a bee-cellar for removing the foul air. Our experience shows conclusively that in our locality, at least, it pays to keep the air in the cellar as fresh as possible at all times during the winter. —ED.]

JAMES HILBERT'S BEE-CELLAR AND WORK-SHOP. SEE EDITORIALS.

SLICED ONION FOR BEE-STINGS, AGAIN.

I can fully indorse the remarks of Mr. E. Webber, of Tolland, Mass., in your issue of July 1, as to the effect of sliced onion for



INTERIOR OF JAMES HILBERT'S BEE-CELLAR. SEE EDITORIAL.

cure of bee-stings, or prevention of swelling and all after-inconvenience from stings. I first used this remedy some 25 years ago, when living and keeping bees in England, and I have never known it to fail, if applied immediately after being stung. I very seldom find any inconvenience or swelling; but if some little time should elapse and swelling have commenced, the onion soon allays the pain and arrests the swelling. Of course, the sting must first be removed. If I have to handle bees I pull up an onion (I keep my bees in the garden), and place it ready to hand. In my case it is *the cure*. Arnica, hot water, ammonia, etc., I have tried, but they are not in it with the onion. Try it, my friends.

C. E. NORTON.
Moncton, N. B., Can.

[As I said before, I am still doubtful about the efficacy of sliced onion; and with all due deference to you and Mr. Webber, I do not believe it has any effect. In most cases the pain will subside without the application of any thing. If the juice of the onion were strongly alkaline—sufficiently so to neutralize the acid of the poison—there might be some reason for it. I used to have in my younger days, when earache used to distress me so, person after person tell me that a hot boiled onion, placed on the outside of my ear, would instantly allay the pain. I tried it repeatedly, but it never had any more effect than any thing else that could hold heat equally well. Still, it may be efficacious with the sting of the bee; and considering the fact that two of our correspondents have suggested it, I shall make an effort to try it at the very first opportunity.—ED.]

DO ALL BASSWOODS BLOSSOM?

Can you tell me whether all basswoods blossom, and how old they must be before they will blossom? If there are some that never blossom, how can I tell them from those that do?

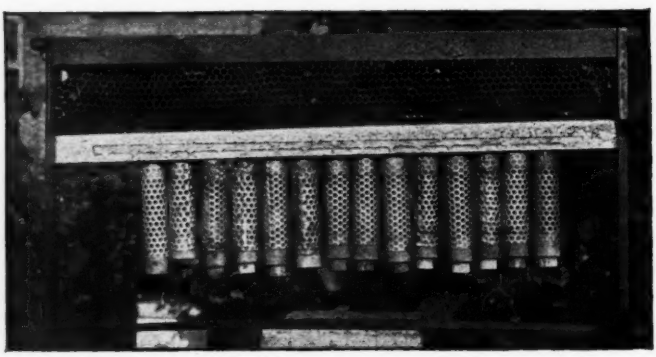
I have a queen that is three years old, and she lays better than a young queen. Would you destroy her on account of her age?

When bees supersede the queen, do they swarm or do they kill her? W. REETZ.
Black Creek, Wis.

[Basswood-trees will blossom, often, when only three or four years old. Some years even old trees will not blossom at all, and some trees blossom only occasionally, while others blossom nearly every year. There is no way by which you can distinguish a good-blossoming young tree from one that does not blossom profusely.

Regarding the queen, a good deal will depend upon what kind of service she is doing. If she is laying well we certainly would not destroy her; but as a rule, three-year-old queens are inferior to those a year old.

As for superseding, we do not know ex-



FOURTEEN VIRGINS FROM FOURTEEN CELLS IN STANLEY CAGES. SEE EDITORIAL.

actly what does take place. In some cases the old queen simply gives out, and the next thing we know she is missing. Whether she dies or the bees make way with her, it would be hard to say in every case.—ED.]

A DEAD MOUSE IN A HIVE.

In 1900 I got a $1.00 select untested queen of the Root Co. She began laying by filling a frame, Hoffman, of drone, then some worker, but never had more than three frames of brood at once. She laid so little that other brood had to be used to keep up strength. Thinking that the long trip by mail might have injured her laying powers, without injury to her stock, some of her brood was put into strongly built-up queenless colonies, and young queens raised which have since given good satisfaction.

While I can not report such a wonderful success as Bro. Doolittle, page 621, I still think the $1.00 was well spent. My Root queen died the next spring, being too feeble to start building up; and the old hive was emptied, the few survivors being united with another colony.

I have been much interested in the queen discussion by Alley, Gallup, and Doolittle; and while many good things were said by them, I think the fact of most importance, both to breeders and to purchasers of queens, is to be found in Doolittle's experience; viz., a queen that has been in the mails, not able to keep up the strength of the colony for honey-gathering, may yet be of great value from which to raise choice queens.

This spring we found a dead mouse between the combs in the lower part of the hive, where it had apparently gone for honey, and met bees instead. It was dried up, and not mummified—i. e., no wax or propolis on it. The colony was in normal condition, but did not cover more than half of the combs at that time, p. 638.

CLARK S. FUGE.

Oregon City, Ore., July 25.

ANOTHER CASE WHERE BEES EMBALMED A DEAD MOUSE.

The question is asked on page 638 if bees would hermetically seal a dead mouse found in their hive. Yes, they will. Some years ago I put a strong swarm of bees in a hive with an entrance large enough to admit a mouse. Some days after, while working opposite this hive, I espied a mouse inside and near the entrance. As it remained quiet, of course I supposed it to be dead, and thought I would remove it at once; but some business of a pressing nature claimed my attention, and I forgot about the mouse. Some days after, while passing through the bee-yard, I thought of the little rodent. The bees seemed to be working all right. I looked in at the entrance, and saw a small mound. I made an examination, and found that they had furnished him a casket, or hermetically sealed him up. I removed the bees to another hive, and took the board containing the casket and kept it a long time as a curiosity. Finally I broke it open. The composition was in color a bluish gray. The outside was rough, but the inside was nicely polished, and no part of it touched the mouse. His hair was smooth; and his tail, folded closely by his side, looked as though he was enjoying a pleasant sleep. Not the least offensive smell could be detected.

F. C. ROSS.

Onawa, Iowa, July 23, 1903.

BEES AS EMBALMERS; BRINGING SWARMS HOME IN A GUNNY SACK.

In your answer to C. L. Sniffen, on page 638, you say it is doubtful whether the bees would cover up with wax or propolis any thing as large as a dead mouse. A few days before reading your answer I was talking with an old bee-keeper here, Mr. M. B. Robinson, and he told me about once finding a dead mouse in a hive. It was a box hive with two sticks crossed in it. The mouse had lodged on the sticks where they crossed, and the bees had covered it with wax and propolis so that it was completely embalmed. He also told me about seeing some one exhibit an embalmed lizard which had been taken out of a bee-tree, at a bee-keepers' convention at Boonville, Mo., several years ago.

We have a fine crop of white clover here, and the bees are doing well. I have taken 700 lbs. of white honey, mostly extracted, from six colonies, spring count, and increased to nine colonies. The bees are still getting honey from white clover, and the prospect is good for the fall honey-flow. In my twelve years' experience in bee-keeping I have never seen white clover hold on so long.

I astonished the natives one day last week by going out into the country about half a mile on my bicycle, and bringing in a swarm of bees in a gunny sack.

JAS. T. SHACKELFORD.

Napton, Mo., July 27.

[We have had other reports showing that bees are competent to embalm dead animals that prove to be in their way. These reports go to show further that bees are very cleanly in their general habits. If I see a dead bee or two in honey, no feeling of nausea comes to me; but not so in the case of a fly or other insect.—ED.]

SWEET CLOVER PREFERRED TO ALFALFA BY A HORSE; A QUEEN OCCUPYING EMPTY COMBS INSTEAD OF FOUNDATION.

I cut a crop of sweet clover this year, thrashing it for seed, and giving some of the straw to the horse. I found it would pick out the old harsh sweet-clover straw in preference to good alfalfa hay. Of course, the leaves were all thrashed off, leaving just the stems; but the horse was very eager for it, while cows would not touch it.

The hay was not cut until the plants were dead and yellow.

I hived a swarm of bees this spring on full sheets of foundation, and placed an extracting-super full of empty combs over them at once. The queen went right to work filling the super with brood. Last week when I was extracting I took off two full supers of honey, and the bottom of the hive was overflowing with bees, all the foundation being built out and full of brood, but no brood in the supers. Other swarms on which I did not place combs until the hive-body was full had no surplus honey whatever, and were much weaker.

Douglass, Kan. D. E. ROSE.

[From my knowledge and experience in the alfalfa country throughout the West, where much sweet clover as well as alfalfa is grown, I should say that the average cow or horse would take alfalfa in preference. It is my impression that, if you were to offer another horse his choice, he would eat the alfalfa first. Sweet clover can be grown very easily on some of the semi-alkali lands; and if stock can be induced to eat it with a relish anywhere near the extent that they will alfalfa, it would be cultivated. There are very few places in the West where I did not see sweet clover, but nowhere did I see it grown as a distinctly hay crop. As in the East, it springs up spontaneously on Western lands; but it very seldom occupies cultivated fields, if I am correct. If this be true it would seem to show that the preference of stock, based on the experience of the ranchers, was decidedly in favor of the alfalfa. I will admit that we have horses and stock here in the East that very often browse on sweet clover in preference to ordinary good grass; and it is far better than some of our wild grasses that grow so rank in our pasture lands.

Your queen, in the case cited, did exactly what I should suppose she would. She would occupy drawn-out combs in preference to foundation. As a rule, a colony will make the center of its brood-nest on the drawn comb, and then gradually work both ways on the foundation after it is drawn into combs. Your experience in getting more honey from the hive with drawn combs is nothing unusual; indeed, it is generally considered that there is no better capital in a bee-yard than good combs. While foundation serves an excellent purpose for the hiving of shaken or natural swarms on, in order that the bees may be forced into the supers, yet in the production of extracted honey it will not compare with the completed combs.—ED.]

MORE BEES POISONED FROM SPRAYING.

With regard to the poisoning of bees here, and as evidence to the same, I can only say that the poisoning of bees has never been noticeable to me with the exception of last May. I perhaps am wrong; but if so, it is certainly a mystery to me, as, upon entering the bee-yard (which but a day or so before was all bustle and hum), it was quite noticeable to me that there was a great reduction in the flight of bees; and at the same time beautiful weather prevailed with dandelion, gooseberry, etc., yielding abundance of honey. One colony I examined had few bees flying, and a few sickly ones crawling about the entrance. This colony but a few days previous covered three to four frames, I would say half full of brood, with new honey stored round the top of each, and one or two back ones (being a Jones hive), with preparation to cap begun in odd places. Not a worker seemed to be left, as I could handle them without smoke. There was brood in all stages in the frames, with apparently nothing but the young downy bees with their queen to care for it, and which could not be covered by them. A few of the neighbors confessed to poisoning their gooseberries at the very time of the disappearance of the bees, thinking it no harm; but none live nearer than ⅜ to ½ a mile from the bees.

In the case of the one I examined, the queen laid from one to four eggs in a cell. Where did the workers go? This colony I lost with a few others, and with plenty of honey still in the frames. Am I wrong in saying it was a case of poisoning?

Notwithstanding the apparent reduction I had in bees in the early part of the season, I have secured from 37 colonies over 3100 lbs. I expected better results, but the season was disappointing at times by occasional cold waves, one of these coming right in the begining of basswood bloom, which is my best source for honey.

GEORGE W. STRANGWAY.

Elora, Ont., Canada.

[From the evidence you have presented, I see no reason to doubt that your bees were poisoned; and if I were you I would enter into some amicable arrangement with the neighbors by which this loss on your part can be avoided. The fact that poisonous liquids are administered to plants where there is no nectar or pollen would surely seem to indicate that the bees were short of water, and took this means of supplying themselves. In that case you had better distribute water-troughs of pure water all about the apiary, during the time the gooseberries are being sprayed.—ED.]

MORE SPRAYING, AND MORE BEES KILLED.

I notice on page 676 that you desire a report of those who had bees poisoned by fruit-growers who had sprayed during full bloom. I am glad you made the request, as I think such a report may have a good influence. Last year I had my colonies very strong in order to get as much of the apple honey as possible, that being my favorite honey; and just when the bees began to store rapidly I noticed all at once thousands of them dropping around the house-apiary and in my yard; and my colonies were depopulated a half, if not more, in two days' time. I was satisfied that poi-

son had been used in spraying fruit-bloom, and immediately made inquiry. All parties denied spraying, yet I found that one had purchased a fruit-sprayer and had sprayed his trees at that time, even though he denied doing so. However, I made a public announcement that the party or parties who killed my bees by spraying his fruit during the time of bloom would also destroy his own fruit, and my prediction proved true; for the same party that had sprayed his trees at that time scarcely had any sound fruit, while an orchard within a stone's throw had hundreds of bushels of fine matured fruit, and no spraying whatever had been done; so I guess there will not be any more spraying done during full bloom in this section. J. A. GOLDEN.

Reinersville, O., Aug. 6.

IS HONEY-DEW SUITABLE FOR A WINTER FOOD?

Will you kindly state whether it is positively known that honey-dew is injurious to winter bees on? There is considerable on the beech-trees and saplings, and bees are working on it at present. It is rather interesting to watch the insects move around on the trees, having what appears to be a tail made of a bunch of cotton, and this the air keeps in continual motion. I cut off a beech-twig having on it a lot of the insects, and the jarring of the twig brought down minute drops of the slightly sticky fluid.

G. B. WESTON.

[Bees have been known to winter well on honey-dew; but in view of the fact that this food is quite liable to bring on dysentery in the spring—is almost sure to—it would be advisable to extract it out and give them good food instead. I know of nothing better or cheaper than a syrup made of granulated sugar. Honey-dew will do very well for stimulating in the spring after cold weather is past.—ED.]

FEEDING OUTDOORS; ROBBING, ETC.

1. Would a swarm isolated a mile or so from all others, fed in the open air, and not placed in the bee-house until too cold for robbing, be likely to begin robbing in the spring?

2. Does feeding from the Miller feeder tend to promote robbing?

3. Would it be detrimental to a swarm to use fences similar to those used between plain sections, between the brood-combs while they were being formed to insure their straightness? A. V. DOUD.

Bristol, N. H., July 22.

[1. A colony isolated a mile or so from the others, and fed in the open air, would not rob nor be the cause of robbing, either at the time of being fed or in the following spring. Even if the bees had been robbing during the previous fall, the memory of their previous experience would probably disappear entirely the ensuing spring, even if a large proportion of the bees didn't die off. But bees taught to rob any time during the summer are liable to rob again in a short time, because they will remember their gala day of plunder, and they are quite apt to go back to their old haunts where first they discovered the booty.

2. The Miller feeder does not promote robbing provided it does not leak and is not filled too full.

3. Fences such as are described can be used for getting evenly drawn combs from foundation.—ED.]

WHEN TO TAKE OFF SUPERS; SYRUP, HOW MAKE, ETC.

There is considerable white clover in bloom, and bees are swarming. How long should I leave the supers on so that the bees can gather enough for winter stores?

What proportion of sugar and water would you mix together to make a syrup to feed for winter stores?

When should one commence to feed for winter, and how much in a day?

How much sulphuric acid would you put into a gallon of water to render wax? Will it corrode a brass kettle?

L. H. LINDEMUTH.

Lehmaster, Pa., Aug. 14.

[If you have been having white clover in bloom, and bees are swarming at the date of your letter, the condition is quite unusual for this part of the country. As long as the bees are storing honey in the supers, leave them on, of course, but the minute they stop, take off the finished sections at least, otherwise they will be soiled.

In feeding, use a mixture of sugar and water, half and half, or a pail of water and a pail of sugar by measure. The bees should be fed up not later than October 1.

The amount of sulphuric acid to use in water to refine wax will depend upon how dirty or discolored the wax is. The solution may be anywhere from one part of acid to 50 or 100 parts of water. If the wax is not very dirty, 200 parts of water to one of acid will be sufficient. It is very seldom that you would want to use a solution as strong as one in fifty. If you use the weaker solution it probably will not corrode the kettle much; but when through using, wash it out thoroughly with soapsuds and hot water.—ED.]

Where does the bee carry its comb? Does it carry any on its legs? When is the proper time to add new queens to the colony, spring or fall? ROBT. PETERSON.

Carl Junction, Mo., Aug. 11.

[Bees do not carry comb, but secrete the wax for it between the scales on the under side of the abdomen. It is then picked up in the mandibles by other bees, and used for comb-building. Pollen and sometimes propolis are carried on the legs, and in rare instances wax. A new queen usually should be given to a colony after the main honey-flow.—ED.]

In all thy ways acknowledge him, and he shall direct thy paths.—PROV. 3:6.

As you have seen by the journals, our carload of bee-keepers started from Chicago on Wednesday evening, Aug. 12, and I believe it was not until after we started that I learned we would reach the Grand Canyon at 5 on Saturday evening, and would leave at 9:30 on Monday morning, so as to give the bee-keepers all *Sunday* to explore. When I asked how such an arrangement came to be made, nobody seemed to know. Probably the railroad company thought that *that* would be exactly what the bee-keepers would want. I could have told them better, and would have been glad to do so had I been consulted. As it was, perhaps I am as much at fault as any one, because I did not in time look out for such a state of affairs. I am glad to say our car of eighteen bee-keepers, men and women, were mostly professing Christians. We sang gospel hymns, and talked temperance, Sabbath observance, etc., almost as a carload of Endeavorers might have done; and some one remarked he had not seen one of *our* crowd in the smoking-car at all. This is a little remarkable, and perhaps it is owing to the fact that the editors of our bee-journals are "clean men" right through.

Well, there was much discussion as to what we ought to do under the circumstances about exploring the canyon on Sunday. Many inquired, a little anxiously, perhaps, what *A. I. Root* was going to do. Of course, they looked to Dr. Miller, Editor York and his good wife, and others, in much the same way; but as your humble servant has in years past been a little more vehement than the rest in denouncing Sunday excursions, it seemed to center somewhat on him. I am free to confess I was puzzled as to what I ought to do, or, if you choose, as to what *God* would have me do that Sabbath day. As all would be up early, we arranged for a morning service at six o'clock.

Our train dropped us Saturday evening on the brink of that awful chasm; and every soul of us, as we gazed down, admitted the sight was worth all it cost, and was worthy of all that had been said about it. The human eye, unused to such vast depths, at first failed utterly to take it in. Our guide pointed out to us some white objects, part way down, and asked us to guess what they were. I said they looked like five-cent sacks of salt that some one had dropped. What I called a sack of salt was really a group of *eight* tents, or sleeping-rooms, belonging to the hotel below. Part way down on the trail they looked like Simplicity bee-hives painted white. These tents were 3100 feet straight down, three miles distant on a bee-line, and *five* miles along the trail.

There were trips out along the rim, both ways; and if we thought best not to take the long trip down to the great river (a full mile straight down, and *eight* miles along the trail), we could take the side trip above. What would be the right and proper thing for a body of Christian people to do on that Sabbath day? I, like many of the rest, had looked forward to this trip almost all my life; and but few if any of us would ever see it again. I went part way down the trail Saturday night, and came up after dark. I was more and more fascinated with every step I took down; and as it was bright moonlight after midnight, I tried to get the manager of the horses to take me down by moonlight Monday morning, and get me back by train time. He flatly refused. I meditated walking down before breakfast, and back before train time; but I knew that, at my age, it would be more than I had any right to undertake. God knows I tell it truly when I say I decided to go away and not take the trip. I had so decided at the morning service; but I concluded it was best not to say so to the rest. Mr. and Mrs. York, at this service, by their beautiful rendering of familiar hymns (assisted by Dr. Miller, of course), made it a most enjoyable meeting. I spoke on the text at the head of this paper, and was happy, even though I had decided to stay all day at the hotel, or near it. I think that God was pleased, if I may so express it, at my willingness to give up *for his sake*. Now, dear friends, do not think me visionary when I say I feel that, *after* thus giving up, he bade me go. I know I am approaching dangerous ground for a spiritual teacher to take, but I believe there is solid rock under my feet.

Our service was over, and I went out near the brink. I had said to some I would advise avoiding hiring horses or setting anybody to *work* on Sunday, as far as possible, and a little crowd of bee-keepers was starting out *on foot*. Only one of our number rode a pony. I said, "Why, boys, if you are going on foot, take off your coats, and, better, vests too. Do not carry an ounce more than you are obliged to. Then you have no canes. You must all get a stout light cane, and, *above all*, each one must carry a bottle of water. It is five miles over the hardest road you ever traveled before you can get a drop of water."

Now, it was right here that the Holy Spirit told me to go with these friends and be *one* of them; at least I felt so then, and I feel so now. I felt very sure that I could contribute to their comfort and happiness, and God gave me strength and endurance that day that made me praise him all day long. We sat down often, and took in the grandeur of that scene. We had confidential talks while we rested; and when we reached a beautiful spring, near the tents, we bathed, not only our dirty

hands and faces, but our tired and sometimes sore feet.

Now, lest I leave the impression that it may not be so *very* bad to *plan* a Sunday excursion, let me give you an incident. As we were washing in the brook we saw two men cutting wood to bring in to the hotel, on mules. As we sat at dinner in the tent, one of our party said:

"I was never more astonished in my life than when I saw those men cutting wood, and drawing it in on Sunday."

The remark was made so loud the two men at another table heard it. I saw the face of one flush a little, and feared we should have a jangle there on Sunday. Soon his reply came, in an even and steady tone:

"And I was never more astonished in *my* life than when I saw your crew coming down here on a 'Sunday excursion.' And after all the profession you fellows make, I should like to know who is most guilty. One of you has been kind enough to say we have given you a good dinner; but this dinner gave us a lot of work, and hard work too."

The man was right. I for one felt the justice and fairness of his rebuke, and I resolved then and there to take *still* more care not to be again entrapped in a Sunday excursion.

We did not take the long trip down to the brink of the river, but followed a path to the edge of a precipice where we could see the yellow muddy waters of the Colorado River where it rushed between the rocks, for four or five miles, but it was 1000 feet or more below where we stood, and nearly straight down. It looked almost as if one could wade through it; but a man who had been down to the water's edge said it was too wide to throw a stone across it. We started from the tents about 2 P. M. to walk up the trail, and took it very leisurely, stopping often to sit down and gaze at the dizzy heights above us. The eye can take in the *real* distance above far better than in looking down. I do not know why this is so. In going up, a queer optical illusion confronted us almost constantly. The wall of rock in front seemed solid, without any possible opening; but when we marched right up to where it seemed the trail *must* enter a tunnel, an opening canyon gradually unfolded. One of our party said his heart was beating so hard he feared palpitation that had troubled him when a boy; and as he feared to be alone he asked me to slow up with him; and as I was pretty tired too we fell behind the rest. Well, when the first ones reached the hotel my friends were so anxious about me, mainly on account of my age, they sent a man with two saddle-horses after me. This cost $1.50, the usual price for bringing up one who gives out on the way. We planned in the morning to go on foot, so as to avoid hiring any one to *work* on Sunday. Some of the crowd carried their dinner, for this reason. I knew *I* should need a good square meal; and as the price was 75 cts. at either place, I reasoned it would be no worse to get it below. You see how it turned out. In spite of my planning, two men worked hard to get up my dinner, and a man and two horses came after me toward night. As it was, I appreciated seeing the strength of a horse take the place of my own; and I also keenly enjoyed watching the horse as he skillfully planted his feet in making the difficult passages, climbing rocky stairs, etc. I do not suppose a horse will ever fall if he has the full rein, and is allowed to decide for himself if it is possible for him to make the passage. A thousand feet or more straight down has no terrors for these trained mountain horses. All horses are shy of going where the footing is insecure; but when they can see and *feel* the solid rock under their feet, and when they can also see where other horses have gone before them, they soon bring into play their excellent judgment, or, perhaps I should say, "horse sense." Monday I felt so well and strong I walked part way down the trail again just for the fun of it; but *Tuesday* my muscles were so sore I could hardly walk until I had got limbered up; and I didn't get entirely over this soreness of the muscles for three or four days.

Before the train left, we took a carriage-drive to Rowe's Point, where the river is visible in three different places. At Sentinel Point the cliff is a full mile higher than the water in the river. A glass is a great aid in looking off these great elevations; but even with the glass, the human eye refuses, as it were, to recognize these vast distances. At the hotel we were told Rowe's Point was three miles distant. The books say it is 1¾ miles; and those of our party who went on foot thought it even less. You can make big wages going on foot. Quite a few ladies make the whole canyon on foot. We had a very pleasant talk with two who had made Yosemite, and were then making the eight-mile trail at Grand Canyon. These two women were alone and unattended.

Our party all voted, I think, that the Grand Canyon is worthy of all that has been said about it; and I do not know that I ever heard of any one who felt disappointed when he came to see it.

Now a concluding word in regard to our text. If we acknowledge God in all our ways he *will* direct our paths; but we can not, as a rule, lay out paths for others; and oftentimes we can not even lay out paths for ourselves. Furthermore, God often calls on us to tread *unexpected* paths.

ALUMINUM INSTEAD OF TIN.

Mr. Root:—Use an aluminum stew-pan with which to heat water and do your cooking, as related in GLEANINGS for June 15. I think you will find it quicker and better than tinware. WALLACE R. MOSES.

West Palm Beach, Fla., June 25.

THE HOTTEST PLACE IN THE UNITED STATES.

We have often heard it said that Yuma, Arizona, is the warmest place in the United States, and many jokes are "cracked" in regard to the heat; but whether it be true or not, I can not say. On Thursday evening, August 27, between 10 and 11 o'clock (the train being late), I went to a hotel in Sentinel, Ariz., for lodging. Sentinel is about 100 miles east of Yuma. The landlord was asleep on a bed out in the door-yard, and I told him I should much prefer a bed out under the stars to one in the house. He pointed to one ready for me, which I had not until then noticed. He opened a door near by, and said I could leave my grip and clothing inside if I chose. Before retiring — come to think of it, was there *really* any "retiring" about it? Well, before going to bed I asked:

"Have you some good drinking-water that won't make me sick?"

Let me explain a little. The kind friends in California, after the convention was over, gave me so many samples of their nice fruit to "just taste," I was having my old trouble of indigestion. I had been dieting on milk toast and such, without any apparent relief, until I was pretty miserable. I was not a little surprised to hear my host so positive concerning two things—first, that it *wouldn't rain*, even if it did continue to lighten; and, next, that the water he brought me would make me *well*, and not worse, no matter how bad my trouble was. The water wasn't very cold, but I was so thirsty (I found by many trials that the ice water on the train would not do for *me* at all), I drank quite freely, thinking I would take my chances. The next morning I was much better. The bad taste had all gone from my mouth, and I drank freely of the water he had so positively declared never had and never *would* hurt anybody. The water was pumped by the railroad company from a well 1200 feet deep. It was identical with the water at the celebrated Agua Caliente springs, ten miles away, and was too hot to drink as it came from the well. In all this region the water is cooled by being hung in the shade, in a canteen covered with burlap, the latter being kept constantly wet. When you are out on the desert, your water to drink is always carried in these covered canteens. I slept nicely, although the temperature was between 90 and 100. The agent over at the depot showed me the daily record from the Weather Bureau, and I found that only a few days before the heat had been, at 2 in the afternoon, 118° in the shade. At breakfast I ate the first good square meal for several days, drinking freely of this artesian water, for there is none other for miles around, and I am happy to tell you I have for four days since eaten what I chose, with a good appetite, three times a day, and have never had a healthier digestion in my life. Is it because this water is one of my latest "fads," or has it really wonderful virtues? I will tell you all I know about it, and you may draw your own conclusions.

I told you last winter of my comical experiences in Cuba in trying to get my Spanish friends to give me a drink of hot water when out in the country, before I had learned to say "agua caliente." Well, when my brother, J. H. Root, urged me to make him a visit, as he had something to show that would interest me greatly, I had to laugh outright at the familiar words, "Agua Caliente" (water hot) as his *post-office*.

In due time we had spanned the ten miles over the dry and sandy desert. Not a drop of water was passed until we reached the springs. It seldom rains here, winter or summer, and there is not a particle of dew. In many places there is almost no vegetation, and this makes it all the more welcome to see the springs with their babbling brooks when we get near the town. There are in all, perhaps, 15 or 20 springs, giving a flow of hot water of about 90 miner's inches all together. The water is so hot you think at first you can not bear it for a bath; but in a little time your body becomes inured to the heat, so most people find it pleasant. Many find it weakening if they stay in very long; but I do not find it so. Below is the analysis:

	Parts in 100,000
Sodium chloride, NaCl (common salt)	32.00
Sodium carbonate, Na^2CO^3	5.30
Sodium silicate Na^2SiO^3	8 02
Sodium sulphate, No^2SO^4 (Glauber salts)	15 00
Potassium sulphate, K^2SO^4	1.57
Calcium sulphate, $CaSO^4$ (gypsum)	3.95
Magnesium sulphate, $MgSO^4$ (Epsom salts)	1.62
Magnesium carbonate, $MgCO^3$	0.46
Iron and alumina, Fe^2O^3 and Al^2O^3	0.30
	68 22
Lithium	trace

The most of the people who come here are cripples or invalids—perhaps more who are troubled with rheumatism than any thing else. Deafness, especially where the trouble is catarrh, is often relieved in a very few days. First, you drink all the water you can, before meals and after, when you go to bed or when you get up, and they say it always helps digestion at once. It has proved strangely true in my case. Next you bathe in the "healing waters" every day or oftener. It makes one *wonderfully* clean, without soap. Then you get your head under water and make it run into your ears, and snuff it up your nose. You know I have for years urged this with common hot water. This treatment, with a daily temperature of from 90 to 110°, would very naturally cleanse the breathing-passages, and prove beneficial. As to whether it will be a lasting benefit, I can not answer. Scores of people go away benefit-

ed, and many claim they are permanently cured. Many say they get relief here, after having tried, with little or no benefit, the other hot springs of the world. For my part, I think I never felt so clean before in my life as I do now as I sit here and write at a temperature of 110° at 2 P. M. Instead of feeling depressed I feel just like work. I wear only the very lightest clothing. At night we wear only a very thin nightgown; and as my brother and I are up before the rest of the neighborhood, we often go about in our nightgowns, lifting them up in "oriental" fashion when we want to walk.

I am much interested in our "iceless refrigerator." They are manufactured and kept for sale in this region. It looks like a common refrigerator, but the sides are of slats, like window-blinds. Inside the slats are sheets of burlap kept constantly wet by a tank on top that lets water drop on each of the four cloth sides. The dry air of this region keeps up an evaporation that reduces the temperature so that butter, milk, etc., keep in very good condition.

The fact that our government holds three of the best springs for the free use of the public gives me confidence in them. All but these three are owned by the hotel, and the usual price is 25 cents for the use of the houses built over them. Many come here with troublesome sores,* and the drinking and bathing certainly seem to have a beneficial effect that may well entitle the springs to be called the fountains of "healing waters." A monument of stones stands on the mountain just back of us, built by a lady with her own hands, as a memorial of her cure from rheumatism. She was so perfectly cured that she not only climbed the mountain but carried the stones and piled them up.

Lest I be accused again of mentioning only the roses and not the thorns, I will add that the place as it is now is not inviting. Tin cans, left by campers, are scattered about everywhere. The principal owner of the place is at present expending considerable money in various improvements. One naturally expects shade-trees and flowers in the vicinity of springs; but they are lacking here. One reason given is, the water is too hot for any thing to grow; but there are a few kinds of wild flowers blooming along the banks of the hot-water streams. There are no cold-water springs, such as we have in the East; but there are springs where the flow is very small, with a temperature nearly normal. The stronger the flow, the higher the temperature, as a rule.

We are told the Indians used these hot springs for the cure of disease, before the white man came; and from the fact that our government endorses and extends its protection over them I think we may thank God for these "healing waters" that come so directly and so freely from his own loving hand.

*Of course, the question will arise, "Is it safe to bathe where so many come with maladies that can hardly be named in print? Is there no danger of contracting something worse than what you have already, especially if you bathe in springs owned by the government, and free to all?" I have looked this matter all over, making careful inquiry. With the great volume of water flowing through these bath-houses, every thing is washed out very quickly. By throwing twigs on the water you can see how quickly every thing goes out and down the stream. People who live below for several miles, however, are careful not to *drink* the water from the springs, unless carried from the head in barrels. The houses where admittance is charged, are, of course, used very much less than the "free" ones.

WINTER OR SAND VETCH — MORE ABOUT IT.

On page 689, Aug. 1, I mentioned sending some of the plants and roots to our Ohio Experiment Station. Below is what they say in regard to it:

Mr. Root:—Yours with plant is just at hand. The plant is, as you suppose, the sand vetch, more commonly known as hairy vetch. It is a very useful plant in some localities, especially on sandy soil. It seems to me that if the soil could be kept covered with it during the winter, and plowed under in the spring, it would help to keep up the soil fertility; at least it has been used that way in many localities. It does better further north than it does here; but we have been growing it for some time. I believe it can be used as a cover crop in orchards. We are trying it for that purpose. It is somewhat difficult to cut for hay, because it lies very flat on the ground; but when sown with rye the two can be cut quite early in the season. The rye supports the vetch, and makes it possible to make hay out it. It is valuable for hay. It should be sown early in the fall. W. J. GREEN.

Wooster, Ohio, July 3.

We also add a couple of letters:

Mr. Root—You ask if any reader knows any thing about wild sweet peas. One year ago I traveled over the Canadian Northwest Territory, and in many places I saw this pea and the seed ripe, and I, like you, thought it might be useful, so I put forty or fifty seeds in my pocket, and brought them home. Last April I took them with others out to plant; but being called away I set them down in a tin, and forgot them. Snow came, and I could not find them for about three days; then they were soaked and pounded as I sowed them, but not one grew; but a few grains of oats and wheat grew that were with them. I think that, where they grow wild, children could gather the seed very easily, as the pods grow in bunches; and I saw them growing plentifully on prairie among weeds, bushes, etc. In my opinion this pea has been the natural food of the prairie-chickens in winter, as it holds its pods above the snow. JAMES R. BELLAMY.

Black Bank, Ont., Can., Aug. 5.

I was not satisfied with the recommendations of this plant given by seed firms. I sent to the Department of Agriculture and received promptly their circular on sand vetch, which I inclose. I sent to a seed company and bought some sand-vetch seed and sowed a row 250 feet long in my experiment grounds, where I sowed a few cow peas and soy beans, all on the same day—June 26, 1902. The vetch made a luxuriant growth until winter set it, when it stopped growing until April last, when it started growing again; and by the middle of May it made as thrifty growth as the plant in your patch. The vetch dried up about the middle of July. The hot sun dried up the bloom almost too fast, and it grew very few seeds. I sowed a quarter of an acre this spring, which is just beginning to bloom.

Ogden, Ill., Aug. 3. B. D. HALL.

With the above, friend Hall incloses a circular from the United States Department of Agriculture, published in October, 1895. It gives a very full account of the plant, directions for cultivation, etc. The name given is hairy vetch, sand vetch, or Russian vetch—*Vicia villosa*. The remarkable thing to me about this plant is that such a valuable forage-plant should be found growing wild in the woods and fields over such a large extent of territory.

Long Tongues Valuable

South as well as North.

How Moore's strain of Italians roll in honey down in Texas.

Hutto, Tex., Nov. 19, 1902.

J. P. Moore.—Dear Sir:—I wish to write you in regard to queens purchased of you. I could have written sooner, but I wanted to test them thoroughly and see if they had those remarkable qualities of a three-banded Italian bee. I must confess to you I am more surprised every day as I watch them. They simply "roll the honey in." It seems that they get honey where others are idle or trying to rob; and for gentleness of handling, I have never seen the like. Friend E. R. Root was right when he said your bees have the longest tongues; for they get honey where others fail. I will express my thanks for such queens. I am more than pleased. I will stock my out-apiaries next spring with your queens. Yours truly,

HENRY SCHMIDT.

The above is pretty strong evidence that red clover is not the only plant which requires long-tongued bees to secure the greatest quantity of nectar.

Daughters of my 23-100 breeder, the prize-winner, and other choice breeders: Untested, 75c each; six, $4.00; dozen, $7.50. Select untested, $1.00 each; six, $5; dozen, $9.00. Safe arrival and satisfaction guaranteed. Circular free. I am now filling orders by return mail, and shall probably be able to do so till the close of the season.

J. P. Moore, L. Box 1, Morgan, Kentucky.

Pendleton County.

Laws' Leather-colored Queens.
Laws' Improved Golden Queens.
Laws' Holy Land Queens.

W. H. Laws:—Your queens have proved to be *excellent.* My apiary stocked with your *Leather* queens is a sight to behold during a honey-flow, and the *Goldens* are beyond description in the line of beauty. Yours are the *best for comb honey* I ever saw. I want more this spring.—*E. A. Ribble, Roxton, Tex., Feb. 19, 1903.*

W. H. Laws:—The 75 queens (Leather) from you are dandies. I introduced one into a weak nucleus in May, and in September I took 285 lbs. of honey, leaving 48 lbs for winter. My crop of honey last season was 48,000 lbs. I write you for prices on 50 nuclei and 150 Leather queens.—*Joseph Farnsworth, Idaho Falls, Idaho, Feb. 16, 1903.*

Prices of Queens: Each, $1.00; 12, $10.00. Breeders, extra fine, guaranteed, each $3.00. Send for price list.

W. H. Laws, Beeville, Texas.

The Best Honey Queens

ON RECORD

Are those reared by The BEE & HONEY CO., Will Atchley, Manager. We breed six distinct races in their purity, from 6 to 35 miles apart, queens ready to go now. We make a specialty of one, two, and three frame nuclei and queens in large lots. Write for prices, they will astonish you. Untested queens of either race, 75c each; $4.25 for six; $8.00 per dozen. Tested, $1.50 to $3.00 each. Breeders, the best that money can buy, $5 00 each. We guarantee safe arrival and perfect satisfaction. Address all orders to

The BEE & HONEY CO.,
Beeville, Box 79. Bee Co., Tex.

Queens -- 1903 -- Queens.

We have ten different yards five to twenty miles apart, where Italians, Cyprians, Holylands, Carniolans, and Albinos, are bred for business. Tested queens, $1.50; $8.00 for 6; $15.00 per dozen. Untested, $1.00 each; $5.00 for 6; $9.00 per dozen. Our best and finest breeders, $5.00 each. One and two frame nuclei a specialty. Bees and Queens in any quantity to suit purchaser. Safe arrival and reasonable satisfaction guaranteed. **ORDER** "The Southland Queen," $1.00 per year. Send for sample copy and our 1903 catalog; tells how to raise queens and keep bees for profit.

Root's Supplies.

The Jennie Atchley Co., Box 18, Beeville, Tex.

Red Clover and Three and Five Banded Queens.

Untested, 75 cts.; $7 per doz. Fine tested queens, $1.00 each. Remember we guarantee our queens to work red clover as well as white clover. Get my circular. Queens go by return mail. Fifty and one hundred, special prices.

G. ROUTZAHN, BIGLERVILLE, ROUTE 3, PENN.

When you need Queens

and want your order filled at once with the *best* queens that money can buy, we can serve you and guarantee satisfaction. We have a fine strain of Italians that can not be excelled as honey-gatherers. We can furnish queens from either imported or home-bred mothers. Choice tested, $1.00 each. Untested, 75c; $8.00 per doz.

J. W. K. Shaw & Co., Loreauville, La.

QUEENS.

3 and 5 Banded, or Golden Long-tongued Bees.

The best for the least money, direct from the breeder. Untested, 55 cts. each; 6 for $3.25; 12 for $6.45. Tested, $1.00 each. Breeders, $3 00 each.

My bees are not excelled by any. Have 700 nuclei. Sent by return mail. This is a postal money-order office. Mention Gleanings when ordering.

DANIEL WURTH,
Karnes City, Karnes Co., Texas.

..Very Satisfactory..

The four dozen queens I got of you last year are very satisfactory, being good honey-gatherers, and gentle, and finely marked. CHAS. STEWART,
Sammonsville, N. Y.
June 19, 1903. State Bee Inspector, 3rd Div.

To induce a trial we offer WARRANTED queens at 75c, six for $3 50; fine select, $1.00, six for $4.50. Queens sent promptly; satisfaction guaranteed. Hybrids or poor queens replaced free.

J. B. CASE, Port Orange, Fla.

Geo. J. Vande Vord

Queen-breeder. Daytonia, Fla.

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100 = Mounted = Queen-cells

and one sample of the Stanley Cell-protector or Introducing-cage, for 70 cents postpaid.

Arthur Stanley, Dixon, Illinois.

Root's Goods in Central Michigan!

Special prices until April 1, 1904. Write your wants; let me name prices. Supplies exchanged for honey.

W. D. Soper, R. D. No. 5, Jackson, Mich.